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PLANETARY PHENOMENA FOR JULY AND  
AUGUST, 1918.

BY MALCOLM McNEILL

PHASES OF THE MOON, PACIFIC TIME

Last Quarter...	July 1, 12 <sup>h</sup> 43 <sup>m</sup> A. M.	New Moon...	August 6, 12 <sup>h</sup> 30 <sup>m</sup> P. M.
New Moon.....	" 8, 12 22 A. M.	First Quarter..	" 14, 3 16 P. M.
First Quarter....	" 15, 10 25 P. M.	Full Moon.....	" 21, 9 2 P. M.
Full Moon.....	" 23, 12 35 P. M.	Last Quarter...	" 28, 11 27 A. M.
Last Quarter....	" 30, 5 14 A. M.		

The Earth is in aphelion, that is, is at its greatest distance from the Sun on the night of July 4th.

*Mercury* is an evening star throughout the two months' period, having passed superior conjunction on June 26th, and it will come to inferior conjunction on September 1st. Greatest east elongation is reached on August 5th. The distance between Sun and planet is then  $27^{\circ} 21'$ , an unusually large greatest elongation, due to the fact that it comes only 38 hours before the time of the planet's aphelion. During the latter half of July and the first few days of August the planet will remain above the horizon an hour or more after sunset and may be seen under good weather conditions, altho the positions are not nearly as favorable as they were during early April. *Mercury* is in conjunction with *Neptune* on July 11th, about  $2^{\circ}$  north; also with *Saturn* on July 17th, a very close conjunction, at the time of nearest approach the planets being only  $26'$  apart, less than the Moon's apparent diameter, *Mercury* passing north of *Saturn*. Both are low down in the evening twilight, but may probably be seen if the sky is clear.

*Venus* remains a morning star, rising rather more than two hours before sunrise, the interval varying less than fifteen minutes during the two months' period. It moves  $79^{\circ}$  nearly due eastward from a point in *Taurus* not far from the first magnitude star *Aldebaran*, *Alpha Tauri*, thru *Gemini* and nearly to the eastern boundary of *Cancer*. During the latter part of the period its distance westward from the Sun is considerably diminished,  $12^{\circ}$  during August, but its distance north of the Sun increases notably, so that the interval between the rising of the planet and of the Sun changes very little. *Venus* is in close conjunction with *Jupiter* in the early morning of July 27th, passing only  $36'$ , a little more than the apparent diameter of the Moon, south of the latter; on the

evening of August 24th it is in conjunction with *Neptune*, passing 37' north of the latter.

*Mars* is still in the western sky in the evening, setting at about 11:30 P. M. on July 1st and at about 9 P. M. on August 31st. During the two months it moves about  $33^{\circ}$  eastward and  $11^{\circ}$  southward thru *Virgo* to the western boundary of *Libra*. On August 3rd it is in conjunction with *Spica*, *Alpha Virginis*, the planet passing about  $2^{\circ}$  north of the star. On August 31st it reaches a point about  $5^{\circ}$  west of the third magnitude star *Alpha Librae*. Its distance from the Earth increases from 119 millions of miles on July 1st to 155 millions on August 31st, a slightly smaller increase than during May and June. Its brightness will also diminish about one-third during the period. At the end of August it will be only about twice as bright as it will be at conjunction. This latter brightness being about equal to that of the pole star, second magnitude, from the latter part of August *Mars* will not be as bright as an average first magnitude star. While this is only a small fraction of its opposition brightness, it will still be easy to see, but will not be conspicuous enough to attract attention.

*Jupiter* passed conjunction with the Sun on June 15th and is now a morning star. On July 1st it rises not quite an hour before sunrise; and this interval increases about two hours each month, so that at the end of August it rises before 1 A. M. It moves about  $14^{\circ}$  eastward from *Taurus* into *Gemini* during the two months, and at the end of the period is about  $10^{\circ}$  west and south of *Castor* and *Pollux*, the two principal stars of *Gemini*. Its conjunction with *Venus* on July 27th has already been mentioned.

*Saturn* is still an evening star during July, but is drawing near to the Sun. The interval between the setting of the Sun and of the planet diminishes from two hours on July 1st, to about half an hour on July 31st; conjunction with the Sun is passed on August 11th and the planet becomes a morning star. By the end of August it will rise about an hour and a half before sunrise. The planet moves about  $8^{\circ}$  eastward in the constellation *Cancer* during the two months.

*Uranus* is getting into better position for evening observation, rising at 10 P. M. on July 1st and at about 6 P. M. on August 31st. During the month it moves about  $2^{\circ}$  westward and southward from *Aquarius* into *Capricorn*. No bright star is near, but it is about  $2^{\circ}$  west and  $1^{\circ}$  north of the 4th magnitude *Aquarii* about August 1st.

*Neptune* reaches conjunction with the Sun on July 30th and becomes a morning star.